

HT-02-012/018

December 10, 2003



Commissioner for Patents
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Subject: | Serial No. 10/661,039 09/12/03 |

Tai Min et al.

MAGNETIC RANDOM ACCESS MEMORY
DESIGNS WITH PATTERNED AND
STABILIZED MAGNETIC SHIELDS

INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation
In An Application.

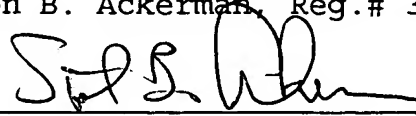
The following Patents and/or Publications are submitted to
comply with the duty of disclosure under CFR 1.97-1.99 and
37 CFR 1.56.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being
deposited with the United States Postal Service as first class
mail in an envelope addressed to: Commissioner for Patents,
P.O. Box 1450, Alexandria, VA 22313-1450, on December 19, 2003.

Stephen B. Ackerman, Reg.# 37761

Signature/Date

 12/19/03

U.S. Patent 6,242,770 to Bronner et al., "Diode Connected to a Magnetic Tunnel Junction and Self Aligned with a Metallic Conductor and Method for Forming the Same," teaches a method for forming thin film conductors as word and bit lines so that the MTJ device is in close proximity to a lower line and a diode is located below that line.

U.S. Patent 6,166,948 to Parkin et al., "Magnetic Memory Array with Magnetic Tunnel Junction Memory Cells Having Flux-Closed Free Layers," discloses that sub-micron dimensions are needed to be competitive with DRAM memories in the range of 10-100 Mbit capacities.

U.S. Patent 5,757,695 to Shi et al., "MRAM with Aligned Magnetic Vectors," teaches the formation of an ellipsoidal MTJ cell wherein the magnetization vectors are aligned along the length (major axis) of the cell and which do not present variously oriented edge domains, high fields and poles at the ends of the element.

U.S. Patent 6,005,800 to Koch et al., "Magnetic Memory Array with Paired Asymmetric Memory Cells for Improved Write Margin," discusses the problem that results when writing to one specific cell also affects the magnetization directions of adjacent cells that are not being addressed.

U.S. Patent 5,650,958 to Gallagher et al., "Magnetic Tunnel Junctions with Controlled Magnetic Response," teaches the formation of an MTJ device suitable for use in an MRAM array wherein the device comprises a free ferromagnetic layer and a pinned ferromagnetic layer which is pinned by interfacial exchange with an antiferromagnetic layer.

U.S. Patent 5,841,692 to Gallagher et al., "Magnetic Tunnel Junction Device with Antiferromagnetically Coupled Pinned Layer," teaches the formation of an MTJ device having free and fixed layers wherein the fixed layer is formed as a sandwich of antiferromagnetically coupled ferromagnetic layers.

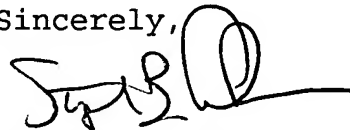
U.S. Patent 5,959,880 to Shi et al., "Low Aspect Ratio Magnetoresistive Tunneling Junction," teaches the formation of a low aspect ratio MTJ device in which two layers of magnetoresistive material are separated by electrically insulating material.

U.S. Patent 5,917,749 to Chen et al., "MRAM Cell Requiring Low Switching Field," provides a rectangular multi-layered MTJ cell comprising two rectangular magnetic layers magnetized in parallel directions along an easy axis corresponding to a direction of magnetic anisotropy and separated by a non-magnetic layer.

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U.S. Patent 6,219,212 to Gill et al., "Magnetic Tunnel Junction Head Structure with Insulating Antiferromagnetic Layer," provides an MTJ device for use as an MRAM cell or as a magnetic field sensor in a magnetic disk drive, in which magnetic material layers disposed above and below the MTJ device.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen B. Ackerman", with a large, stylized "S" and "A" and a long horizontal stroke extending to the right.

Stephen B. Ackerman,
Reg. No. 37761

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10/661,039

Applicant

Tai Min et al.

Filing Date

09/12/03

Group Art Unit

INFORMATION DISCLOSURE CITATION
IN AN APPLICATION

(Use several sheets if necessary)

U. S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	6242770	6/5/01	Bronner	257	295	8/31/98
	6166948	12/26/00	Parkin et al.	365	173	9/3/99
	5757695	5/26/98	Shi et al.	365	158	2/5/97
	6005800	12/21/99	Koch et al.	365	173	11/23/98
	5650958	7/22/97	Gallagher et al.	365	173	3/18/96
	5841692	11/24/98	Gallagher et al.	365	173	7/16/97
	5959880	9/28/99	Shi et al.	365	158	12/18/97
	5917749	6/29/99	Chen et al.	365	173	5/23/97
	621921	24/17/01	Gill et al.	360	324.2	9/8/98

FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
					YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.